TM 2 Sampling Freshly Mixed Concrete

1. According to this FOP, a concrete sample from a stationary mixer is…
   a. obtained from the mixer after at least 1/2 yd^3 has been discharged. It consists of a composite of at least two increments from the middle portion of the load that are mixed together to form the sample.
   b. obtained after at least 1/2 yd^3 has been discharged from the mixer by passing a receptacle through the discharge stream or by completely diverting the discharge into a sample container.
   c. taken after discharge of the mixer contents and consists of at least five increments obtained from the pile. Care must be taken to not contaminate the sample with underlying subgrade.
   d. None of the above.

2. When performing wet sieving…
   a. discard all mortar adhering to both the wet sieving equipment and oversize material.
   b. the sieve size used is designated by the individual test method(s) that must be performed.
   c. recover all mortar adhering to both the wet sieving equipment and the oversize material and include with the sample.
   d. the sample container must be in a dry, clean condition.

3. Complete the test for temperature and start tests for slump, air content, and casting of strength specimens within 5 minutes of obtaining the sample.
   a. True
   b. False

4. For all sampling methods, the receptacle or sample container…
   a. must be in a clean, dry condition, and be large enough to allow remixing of the sample without loss of material.
   b. must be damp.
   c. must be a wheelbarrow.
   d. must have a volume of 1.0 ft^3.

5. When sampling from open-top truck mixers, agitators, non-agitating equipment or other types of open-top containers…
   a. the sample may be taken only after discharge of the material by obtaining five increments from the pile of concrete, avoiding contamination from subgrade materials.
   b. obtain the sample by whichever of the procedures in TM 2 that is most applicable under the given conditions.
   c. take the sample after at least 1 yd^3 has been discharged. Sample by passing the sampling receptacle through the entire stream, or by diverting the entire discharge stream into the sample container.
   d. None of the above

T 309 Temperature of Freshly Mixed Portland Cement Concrete

6. Which of the following best describes the container for the temperature test at the time of sampling?
   a. Made of non-absorptive material. Large enough to permit 3 in. of concrete in all directions around the sensor; concrete cover must also be at least five times the nominal maximum coarse aggregate size.
   b. Made of non-absorptive material. Damp. Large enough to permit 3 in. of concrete in all directions around the sensor; concrete cover must also be at least three times the nominal maximum coarse aggregate size.
   c. Made of any convenient material and large enough to permit 2 in. of concrete in all directions around the sensor; concrete cover must also be at least three times the nominal maximum coarse aggregate size.
   d. None of the above.

7. According to this FOP…
   a. the concrete being tested for temperature must always be obtained according to the FOP for WAQTC TM 2.
   b. the procedure covers the determination of the temperature of freshly mixed portland cement concrete.
   c. agency specifications may prohibit temperature determination on concrete having a temperature below 36°F or above 90°F.
   d. the test must be finished within 30 minutes of obtaining the sample.

8. The temperature-measuring device must be capable of measuring temperature of freshly mixed concrete to ± 0.5°F throughout the entire temperature range likely to be encountered in the fresh concrete.
   a. True
   b. False

9. The temperature-measuring device shall be verified for accuracy _____ and whenever there is a question of accuracy by making comparisons with another calibrated instrument at _____ temperatures at least 27°F apart.
   a. annually -- three
   b. annually - - two
   c. semi-annually - - three
   d. bi-annually - - two
   e. None of the above.

10. According to this FOP, for concrete containing aggregate of a nominal maximum size greater than 3 in. …
    a. it may require up to 30 minutes for the transfer of heat from the aggregate to the mortar after sampling.
    b. it may require up to 20 minutes for the transfer of heat from the aggregate to the mortar after batching.
    c. the temperature determination must be completed within 5 minutes of obtaining the sample and after leaving the sensor in the concrete for at least 2 minutes.
    d. None of the above.

T 119 Slump of Hydraulic Cement Concrete

11. When filling the slump mold, the first layer should fill the mold to a depth of approximately _____. The second layer should fill the mold to a depth of approximately _____ ,
    a. 2 in. - - 4.5 in.
    b. 2⅝ in. - - 6⅛ in.
    c. 4 in. - - 8 in.
    d. None of the above.

12. When rodding the second and third layers, the tamping rod should…
    a. just penetrate into the underlying layer. The first half of the strokes should be inclined to match the slope of the slump mold.
    b. just penetrate into the underlying layer. The rod should be vertical for the number of strokes required by the FOP.
    c. penetrate 1 in. into the underlying layer. The first half of the strokes should be inclined to match the slope of the slump mold.
    d. penetrate 1 in. into the underlying layer. The rod should be vertical for the number of strokes required by the FOP.

13. The slump test is not applicable to _____ and _____concrete. The test must be completed within an elapsed time of _____.
    a. plastic - - cohesive - - 5 minutes
    b. non-plastic - - non-cohesive - - 2½ minutes
    c. non-plastic - - cohesive - - 2½ minutes
    d. moderate slump - - high slump - - 5 minutes

14. It is permissible to strike off the concrete surface with the strike-off bar.
    a. True
    b. False

15. Which of the following best describes the interior surface of the slump mold when it is prepared to conduct the slump test?
    a. Clean, smooth, seamless, free of dents.
    b. Clean, smooth, seamless, damp, free of projections or dents.
    c. Clean, smooth, free of projections or dents.
    d. Clean, smooth, damp, free of projections.
    e. None of the above.

T 121 Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

16. A lower density from the established mix design will often indicate an _____. As a result, cement content per unit of volume will probably be _____ than the mix design cement content. This condition may result in _____ strength.
    a. under-yield (volume less than intended) - - greater - - higher
    b. over-yield (volume greater than intended) - - greater - - higher
    c. under-yield (volume less than intended) - - less - - lower
    d. over-yield (volume greater than intended) - - less - - lower
    e. None of the above.

17. The strike-off plate for this method…
    a. may be constructed of 1/2 in. thick metal or glass with a length and width at least 2 in. greater than the measure diameter.
    b. must be a metal or acrylic plate at least 1/2 in. thick having a length and width at least 2 in. greater than the measure diameter. The plate edges must be straight and smooth within tolerance of $1/16^{th}$ in.
    c. may be a glass plate at least 1/4 in. thick having a length and width at least 1 in. greater than the measure diameter.
    d. may be constructed of any material having a thickness of at least 1/4 in. with edges straight and smooth within tolerance of $1/16^{th}$ in.

18. After filling the measure, prior to striking off the concrete surface, it is noticed that there is a great excess of concrete. What must be done?
    a. Proceed immediately with the strike-off procedure.
    b. Remove a representative portion with the scoop and then proceed with the strike-off procedure.
    c. Start the test over. Fill and consolidate the concrete in the measure in such a way that a small excess of concrete (about 1/8 in.) is present above the top of the measure.
    d. None of the above.

19. After the strike-off procedure is complete what must be done?
    a. Clean excess concrete from the exterior and determine the mass of the filled measure.
    b. Subtract the mass of the dry, clean, empty measure from the mass of the measure filled with concrete.
    c. Divide the mass of the concrete by the volume of the measure and report the density to the nearest 0.1 lb/ft^3.
    d. All of the above.

20. Cement Content Calculation:

$$N = \frac{N_t}{Y}$$

N = Actual Cement Content
N_t = Mass of Cement Batched
Y = Yield

Known:

Design Cement Content	= 611 lb/yd^3
Mass of Cement Batched	= 610 lb/yd^3
Design Batch Size	= 8.00 yd^3
Yield	= 7.87 yd^3

Adjusted for yield, the actual cement content per cubic yard is _____.

a. 610 lb/yd^3
b. 621 lb/yd^3
c. 625 lb/yd^3
d. 620 lb/yd^3
e. Insufficient information is provided to correctly answer this question.

T 152 Air Content of Freshly Mixed Concrete by the Pressure Method

21. When the concrete contains aggregate retained on the _____ sieve, the sample must be wet sieved over the _____ sieve.
    a. 3 in. - - 2 in.
    b. 2 in. - - 1½ in.
    c. 1½ in. - - 1 in.
    d. Not applicable, wet sieving is not permitted for this test.

22. Which of the following most thoroughly describes the mallet used during consolidation of concrete for this test method?
    a. Mallet with a rubber head having a mass of 0.57 ± 0.23 lb.
    b. Mallet with a rubber or rawhide head having a mass of 2.25 ± 0.5 lb.
    c. Mallet with a rubber head having a mass of 1.25 ± 0.25 lb.
    d. Mallet with a rubber or rawhide head having a mass of 1.25 ± 0.5 lb.

23. Given that agency specification requires concrete slump in the range of 1 to 2.5 in. the sample may be consolidated by…
    a. vibration only.
    b. rodding only.
    c. rodding or vibration.
    d. None of the above.

24. When performing air meter calibration, gauge readings after removal of 5.0% of the water must be within what range?
    a. Gauge reading must be 5.0.
    b. Gauge reading must be 4.9 to 5.1.
    c. Gauge reading must be 4.8 to 5.2.
    d. Gauge reading must be 5.0 to 5.1.

25. After strike-off of the concrete surface what next must be done?
    a. Clamp the cover on the bowl and fill with water through one petcock to eliminate air bubbles.
    b. Moisten the inside of the cover, clamp the cover on the bowl and fill with water through one petcock to eliminate air bubbles.
    c. Clean the top flange of the bowl, moisten the inside of the cover and clamp the cover on the bowl.
    d. Moisten the top flange of the bowl, clean the inside of the cover and clamp the cover on the bowl.

T 23 Making and Curing Concrete Test Specimens in the Field

26. Beam molds for this procedure…
    a. must be rectangular in shape with ends and sides at right angles to each other.
    b. must be rigid enough to resist warpage.
    c. must produce specimens with length 1/4 in. shorter than that required.
    d. shall have width and depth of 8 inches unless otherwise required by specification.
    e. a & b

27. Which of the following best describes the relation between consolidation methods and slump of concrete?
    a. Concrete with slump less than 1 in. must be consolidated by vibration. Concrete with slump between 1 and 3 in. may be consolidated by either vibration or rodding. Concrete with slump exceeding 3 in. must be consolidated by rodding.
    b. Concrete with slump less than 1 in. must be consolidation by vibration. Concrete with slump greater than 1 must be consolidated by rodding.
    c. Concrete with slump less than 1 in. must be consolidation by vibration. Concrete with slump between 1 and 4 in. may be consolidated by either vibration or rodding. Concrete with slump exceeding 4 in. must be consolidated by rodding.
    d. Concrete with slump of 1 in. or less must be consolidation by vibration. Concrete with slump greater than 1 in. may be consolidated by vibration or rodding.

28. When rodding is required, which of the following best describes how 4 in. by 8 in. single-use cylinder molds are filled and consolidated?
    a. Molds are filled in three layers and consolidated with 25 strokes per layer using the 5/8 in. diameter rod. After consolidation, molds are tapped lightly 10 to 15 times with the rod.
    b. Molds are filled in two layers and consolidated with 25 strokes per layer using the 3/8 in. diameter rod. After consolidation, molds are tapped lightly 10 to 15 times with the rod.
    c. Molds are filled in two layers and consolidated with 25 strokes per layer using the 3/8 in. diameter rod. After consolidation, molds are tapped lightly 10 to 15 times with the open palm of the hand.
    d. Molds are filled in three layers and consolidated with 25 strokes per layer using the 3/8 in. diameter rod. After consolidation, molds are tapped lightly 10 to 15 times with the open palm of the hand.

29. When vibration is required, 6 in. diameter cylinder molds are filled in…
    a. two layers, with two insertions of the vibrator per layer.
    b. one layer, with two insertions of the vibrator.
    c. two layers, with one insertion of the vibrator per layer.
    d. three layers, with 25 insertions of the vibrator per layer.

30. When beams are being made, and rodding is the required consolidation method…
    a. fill the mold in one layer. Distribute 66 strokes of the rod uniformly over the surface area.
    b. fill the mold in two layers. Distribute 66 strokes of the rod uniformly over the surface area of each layer. When rodding the second layer, penetrate about 1 in into the underlying concrete.
    c. fill the mold in two layers. Distribute the strokes of the rod uniformly over the surface area of each layer (one stroke per 2 in^2). When rodding the second layer, penetrate about 1 in into the underlying concrete.
    d. fill the mold in three layers. Distribute the strokes of the rod uniformly over the surface area of each layer (one stroke per 2 in^2). When rodding the second and third layers, penetrate about 1 in into the underlying concrete.